

CLAIMS

- 5 1. A method for providing an indication of aircraft
height relative to an obstruction in a terrain
awareness warning system, comprising:
receiving a first datum indicative of a geographic
feature of an obstruction;
10 receiving a second datum indicative of a distance of
the geographic feature from an aircraft;
receiving a third datum indicative of a height of the
aircraft;
receiving a fourth datum indicative of a speed of the
15 aircraft;
calculating a projected height of the aircraft at the
location of the obstruction using the first
through fourth data;
generating a result signal based on the projected
20 height and the first datum; and
displaying an indication on a display screen based on
the generated result signal.
- 25 2. The method of claim 1, wherein the first datum is a
height of the obstruction.
- 30 3. The method of claim 3, wherein the indication is a
colored area on a display screen having a color
selected from the group consisting of: red, yellow,
green, and black.

4. The method of claim 1, wherein the receiving a fourth datum step further comprises: resolving the speed of the aircraft into components including a lateral speed and a vertical speed.

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5. The method of claim 2, further comprising calculating a pitch angle of the aircraft from the received fourth datum.

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6. The method of claim 5, further comprising calculating an effective altitude of the aircraft by adding to the third datum a value equal to the second datum multiplied by the tangent of the pitch angle.

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7. The method of claim 6, further comprising generating a first alert signal if the effective altitude is less than the sum of the first datum and a safety elevation.

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8. The method of claim 7, wherein the safety elevation is zero.

9. The method of claim 7, further comprising sounding an audible alarm as the first alert signal.

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10. The method of claim 7, further comprising displaying a first colored indication at a display location corresponding to the second datum as the first alert signal.

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11. The method of claim 10, wherein the colored indication is a red area.

12. The method of claim 6, further comprising generating
a second alert signal if the effective altitude is
greater than the sum of the first datum and a safety
elevation but less than a sum of the first datum, the
safety elevation, and a first distance.

13. The method of claim 12, further comprising displaying
a second colored indication at a display location
corresponding to the second datum as the second alert
signal.

14. A computer program, stored in a machine-readable
format, for a terrain awareness warning system, for
causing a computer to:

receive a first datum indicative of a geographic
feature of an obstruction;

receive a second datum indicative of a distance of
the geographic feature from an aircraft;

receive a third datum indicative of a height of the
aircraft;

receive a fourth datum indicative of a speed of the
aircraft;

calculate a projected height of the aircraft at the
location of the obstruction using the first
through fourth data; and

generate a result signal based on the projected
height and the first datum.

15. An apparatus for providing an indication of aircraft height relative to an obstruction in a terrain awareness warning system, comprising:

5 a first input for a first signal from an instrument measuring a height of an aircraft;

a second input for a second signal from an instrument measuring a location of the aircraft;

10 a third input for a third signal from an instrument providing information about geographic features of terrain surrounding the aircraft;

a fourth input for a fourth signal from an instrument measuring a speed of the aircraft;

15 means for employing the signals from the first through fourth inputs to calculate an effective height of the aircraft relative to at least the third input; and

a screen display for displaying the results of the calculation.

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16. The apparatus of claim 15, wherein the instrument measuring a height of the aircraft and the instrument measuring a location of the aircraft is an altimeter, and wherein the instrument providing information about
25 geographic features of terrain surrounding the aircraft and the instrument measuring a speed of the aircraft is an aid to navigation.

17. The apparatus of claim 16, wherein the aid to
30 navigation is a global positioning system unit.

18. The apparatus of claim 15, further comprising a conventional TAWS altitude display and means to toggle the screen display between the conventional TAWS altitude display and the screen display for displaying the results of the calculation.

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19. The apparatus of claim 15, wherein the first through fourth inputs form at least a portion of a parallel data bus.

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20. The apparatus of claim 15, wherein the first through fourth inputs form at least a portion of a serial data stream.

21. A method of performing terrain awareness warning for an aircraft, comprising:

collecting data of terrain features in the vicinity of an aircraft;

collecting data of the distance and bearing of the terrain features from the aircraft;

collecting data of the height and speed of the aircraft;

calculating a projected height of the aircraft at the location of each of the terrain features based on the collected data of the height and speed of the aircraft;

generating result signals based on the projected height, the collected data of terrain features, and the bearing of the terrain features; and

displaying indications on a display screen with respect to bearing based on the generated result signals.

22. A method for providing an indication of lateral aircraft position relative to an obstruction in a terrain awareness warning system, comprising:

5 receiving a first datum indicative of the bearing of an obstruction relative to an aircraft;

receiving a second datum indicative of a distance of the obstruction from the aircraft;

10 receiving third data indicative of a speed of the aircraft;

calculating a projected flight path of the aircraft relative to the obstruction using the first through third data and determining a distance between the projected flight path and the obstruction at a series of points along the projected flight path;

15 generating a result signal based on the determined distance; and

20 displaying an indication on a display screen based on the generated result signal with respect to the bearing.